LINCOLN
APPLIED GEOLOGY, INC.
Environmental Consultants

May 21, 1997

Mr. Robert Haslam
Hazardous Materials Management Division
Vermont Department of
Environmental Conservation
103 South Main Street
Waterbury, Vermont 05676

RE: May 1997 Status Report for the Northern Petroleum Company (NPC) Site, St. Johnsbury, Vermont (VDEC Site #91-1169)

Dear Mr. Haslam:

On March 12, 1997, a letter was issued to NPC by your Division resolving the reimbursement issue that has been on-going since Fall 1996. It stated that the PCF would reimburse 75% and that NPC would contribute 25% of all eligible costs necessary to appropiately address the contamination noted at the site. As a result monitoring and water quality sampling work was re-initiated by Lincoln Applied Geology, Inc. (LAG) in late March 1997. It should be noted that during the period when monitoring and sampling was suspended, the staff at NPC continued the passive product recovery efforts at the facility without interruption.

This report outlines the results of the recent monitoring and ground water quality sampling round that was completed on March 25, 1997 by LAG as part of the March 12, 1997 agreement letter. In this regard, LAG measured ground water levels, headspace volatile organic concentrations, and collected ground water samples from all accessible monitor wells on March 25, 1997.

Enclosed for your information and use in reviewing this summary report are the following:

Table 1,	Ground Water Elevation and Product Thicknesses;
Table 2,	Headspace Photoionization Results;
Table 3,	Ground Water Quality Summary;
Figure 1,	Ground Water Contour Map for March 25, 1997;
Figure 2,	Ground Water Quality Summary Map for March 25, 1997;
Chart 1,	Cumulative Product Recovery Trends;
Charts 2 & 3,	Ground Water Level Trends;
Charts 4 & 5,	Liquid Level Trends;
Charts 6 & 7,	BTEX Water Quality Trends;
Charts 8 & 9,	MTBE Water Quality Trends;
Appendix A,	Recent NPC Soakease Monitoring Logs; and
Appendix B,	March 25, 1996 Water Quality Laboratory Results.

Revell Drive • Lincoln, Vermont 05443 • (802) 453-4384 • FAX (802) 453-5399

Water Levels and Product Recovery

The updated cumulative product recovery trend graph is presented as **Chart 1**. The monitoring data utilized to estimate product recovery is based on the NPC logs (includes as **Appendix A**) and the adsorptive capacities of the Soak Ease bailers. From May 1996 through March 1997 we estimate that approximately 8.05 gallons of product was removed from wells MW-1, 3, 9, 10, 11, and 14. The majority of the recovered product (5.74 gallons) came from MW-1, the 4-inch well installed at the location of the former UST. Only 1.62, 0.44 and 0.25 gallons were recovered from wells MW-11, MW-14, and MW-3, respectively. No product was recovered from MW-9 or 10 during this period. **Chart 1** describes a declining rate of recovery over the course of the past year. These data suggest that the passive recovery efforts are having an overall positive effect on the amount of free floating product that remains in the subsurface. It should be noted that a total of 254 gallons of free floating product has been removed since passive recovery efforts began at this site.

As seen in **Table 1** and **Charts 2** and **3**, ground water levels have continued to fluctuate significantly in response to seasonal variations and precipitation events. **Charts 4** and **5** demonstrate how such variations influence the presence of free floating product in MW-1 and MW-11, respectively. There does appear to be slightly more recoverable product when ground water levels are lower. Previously collected data indicate that the residual adsorbed phase product is associated with the finer textured soils overlying the coarser sand and gravels. The ground water flow direction and gradient have remained relatively consistent and easterly towards the Passumpsic River since site monitoring commenced in 1992. **Figure 1** is a Ground Water Contour Map prepared from March 25, 1996 water level data.

Vapor Monitoring

As shown in **Table 2**, cumulative well headspace photoionization detector (PID) assays indicate that elevated vapor levels have been previously detected in wells MW-1, 2, 3, 9, 10, 11, 14, and AH-1. Recent PID monitoring data indicate that only elevated levels were detected in well MW-8 and only low to moderate PID assays were noted in wells MW-1, MW-2, MW-10, MW-11, and MW-14. These recent PID data seem to suggest that vadose zone related contaminants have declined in the past year.

Water Quality

In accordance with your March 12, 1997 letter, a water quality sampling round was initiated on March 25, 1997. Laboratory results are summarized in **Table 3**. Copies of the March 1997 results are included in **Appendix B**. A water quality summary map for the

March 1997 sampling round is presented as **Figure 2**. Trend graphs of water quality are presented as **Charts 6** and **7** for the BTEX constituents, and **Charts 8** and **9** for MTBE. In general, soluble phase contaminants in these wells appear to be fairly stable with time. High concentrations remain in areas where free product has been observed/recovered. Low concentrations remain in the upgradient wells and the far downgradient wells indicating that extensive migration of soluble phase contaminants is not yet occurring. The migration pattern of both free phase and soluble phase contaminants is as expected based on the ground water flow direction.

Conclusions and Recommendations

Significant, but stable, free product and dissolved phase petroleum based contaminant plumes continue to exist in the NPC source area and downgradient of it on the Sangravco property. However, the apparent lack of migration of dissolved phase contaminants significantly beyond the limits of reoccurring free phase product is probably due to the passive free product recovery efforts and the natural biodegradation of the contaminants within and at the periphery of the contaminant plume. This opinion is based on our evaluation of contaminant trends and experiences at other petroleum contaminated sites within Vermont supported by our interpretation of chromatographic patterns generated during the quantification of the MTBE and BTEX constituents.

Based on the data presented in this report, we recommend continued passive recovery of the free phase product because current estimates show that recovery rates are beginning to slow. If rates increase throughout the next year then we would be inclined to recommend testing a more active product recovery method. It is also recommended that future site monitoring and ground water sampling be performed on a monthly and semi-annual basis, respectively.

Please feel free to contact me or Alan Moore, P.E., LAG Project Engineer, with any questions or comments you may have.

Sincerely,

Richard S. Vandenberg, CPG
Hydrogeologist

RSV/clk
enclosures
cc: William Sellinger

Lincoln Applied Geology, Inc
Environmental Consultants
Revell Drive • Lincoln, Vermont 05443 • (802) 453-4384 • FAX (802) 453-5399

Table 1
VDEC Site # 91-1169
Sheet 1 of 1

Project: Northern Petroleum
Location: St. Johnsbury, Vermont

Ground Water Elevation/Product Level (feet)

Data Point	TOC	9-18-95	9-19-95	10-24-95	11-16-95	4-9-96	3-25-97	
MW-1	100.00	0.17 92.38		0.05 93.22	94.00	94.29	94.35	
MW-2	99.18	92.06		92.96	93.74	93.99	94.06	
MW-3	98.66	0.40 91.56		92.76	93.58	93.58		
MW-4	98.10	90.70		91.58	91.52	92.29	90.07	
MW-5	99.24	91.79		91.83	92.73	92.07		
MW-6	99.37	90.32		91.67	92.62	91.87	91.92	
MW-7	98.26	91.69		92.53	93.40	93.34	93.35	
MW-8	97.73	91.28		92.23	93.11	92.94	92.90	
MW-9	98.49	<93.37		<93.36	<93.32	<93.32	<93.29	
MW-10	98.58	91.58		92.94	93.66	93.87	93.95	
MW-11	100.64	<92.99		0.18 93.16	93.97	0.08 94.37	95.49	
MW-12	103.36	93.21		93.71	94.49	95.07	95.07	
MW-13	105.08	93.03		93.64	94.41	94.83	94.94	
MW-14	99.40	2.45 90.05	1.17 91.08	0.11 92.65	93.32	93.48	93.45	
MW-15	98.46	91.15		92.09	92.54	92.54	92.60	
AH-1	104.55	93.21		93.72	94.13	94.82	95.13	

NOTES:
1 - Elevation datum assumed
2 - Reference elevation is elevation of top of PVC well casing
* - Water entering at top of casing
Light Gray - Dry
Dark Gray - Inaccessible

Project: Northern Petroleum
Location: St. Johnsbury, Vermont

Table 2
Site # 91-1169
Sheet 1 of 1

Photoionization Results (PID - ppm)

Data Point	8-8-95	9-18-95	9-19-95	10-24-95	11-16-95	4-9-96	3-25-97	
MW-1	SL	SL		SL	SL	150	52	
MW-2	20.0	38		SL	BG	SL	13.8	
MW-3	180	SL		SL	SL	150		
MW-4	3.6	2.6		4.0	BG	0.8	82	
MW-5	1.0	5.8		0.4	BG	BG		
MW-6	BG	BG		BG	BG	BG	4.4	
MW-7	0.4	BG		BG	BG	0.2	BG	
MW-8	BG	BG		BG	BG	BG	BG	
MW-9	30	SL		200	180	SL	SL	
MW-10	200	BG		100	30	5.0	7.0	
MW-11	SL	50		SL	180	120	19.2	
MW-12	BG	BG		BG	BG	0.2	BG	
MW-13	BG	BG		BG	BG	BG	BG	
MW-14	SL	250	380	SL	SL	150	110	
MW-15	2.0	15.0		1.4	0.8	2.6	5.0	
Sanitary Sewer	BG	BG		BG	BG	BG	BG	
Manway	BG	BG		BG	BG	BG	BG	
AH-1	80	26		60	48	SL	30	

NOTES:
BG - Background
SL - Saturated Lamp
* - PID measurements taken with system off
Dark Gray - Inaccessible

Project: Northern Petroleum
Location: St. Johnsbury, Vermont

Table 3
Site # 91-1169
Sheet 1 of 1

Ground Water Quality Results (ppb)

Data Point	4-20-94	10-6-94	2-9-95	4-6-95	10-24-95	4-9-96	3-25-97	
MW-1	<500 24360	<500 37310		<2500 22000	<500 34900	<500 15650	<500 8960	
MW-2	<1 16	<1 32		<5 31.6	<5 10.4	<5 40.2	<5 54	
MW-3		5470 28280		4300 29600	4000 295000	12000 31420		
MW-4	3 <6	<1 <6		<5 <6	<5 <6	12 <6	insufficient recharge	
MW-5	49 <6	106 <6		32 23	33 <6	12 11.4		
MW-6	<1 <6	112 <6		7.5 6.8	23 <6	14 <6	12 <6	
MW-7	<1 <6	80 <6		6.5 <6	56 <6	<5 <6	<5 <6	
MW-8	14 <6	16 <6		5 <6	14 9.2	<5 <6	<5 <6	
MW-9								
MW-10	<10 839	<200 39300		<1,000 20200	<500 28100	<500 20410	<500 23200	
MW-11	998 1086	326 2537		560 3330		<2,500 8720	<250 3260	
MW-12	<1 <6	<1 <6		<5 <6		<5 <6	<5 <6	
MW-13	<1 <6	<1 <6		<5 <6	<5 <6	<5 <6	<5 <6	
MW-14	3060 50620	5230 55430		4700 24630	2200 38900	8300 11780	<500 1510	
MW-15	37 <6	780 99		390 130	740 46	1200 435	290 135	
AH-1			<15 1972	<100 2440	<500 17060	<500 4630	<500 4760	

NOTES:
MTBE in upper right corner of cell
BTEX in lower left corner of cell
< - Contaminant not detected at specified detection limit
Dark gray - well inaccessible
Light gray - well dry

Northern Petroleum, St. Johnsbury, VT
Cumulative Product Recovery Trends

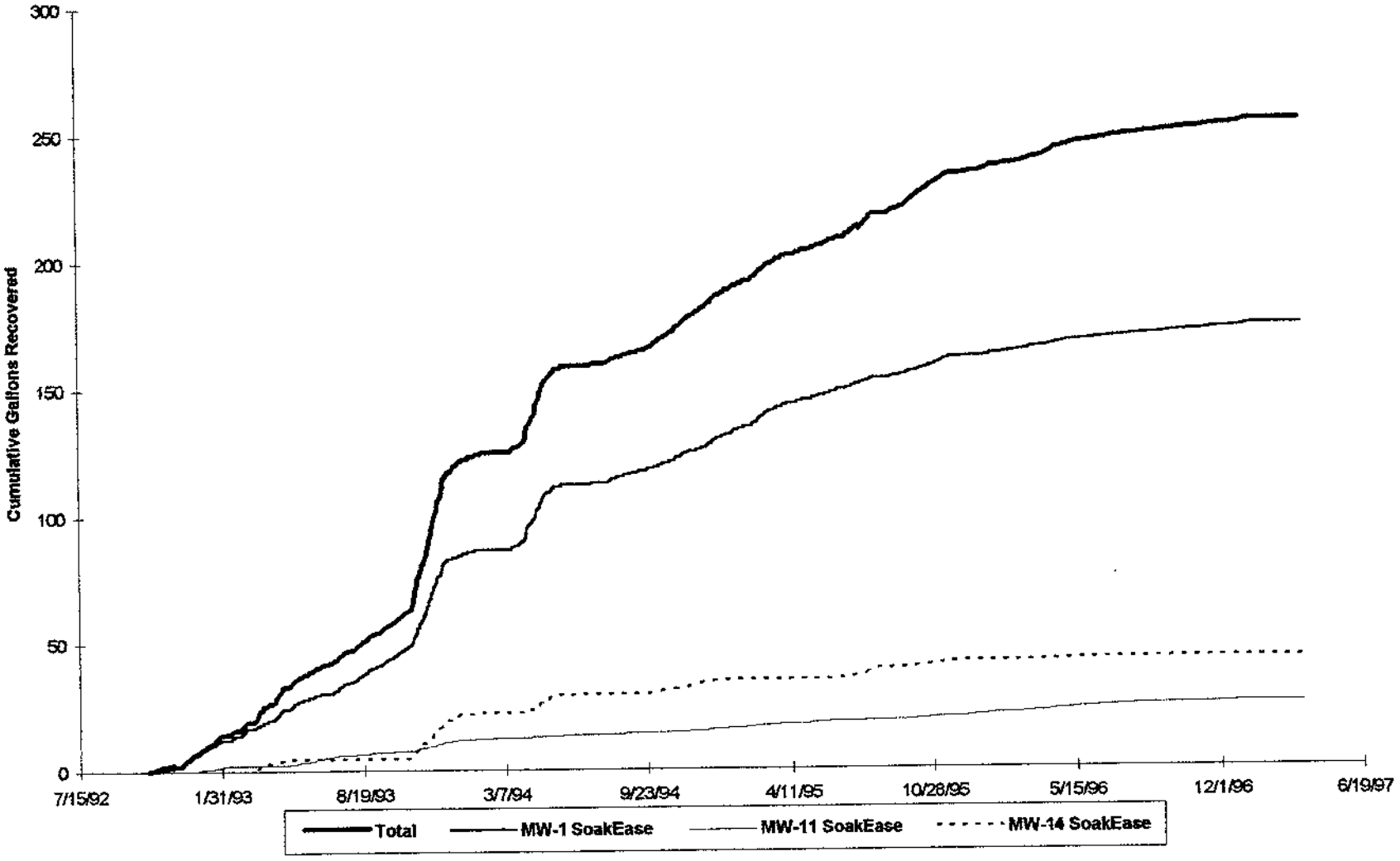

Chart 1

Northern Petroleum - St. Johnsbury, VT.
Ground Water Level Trends

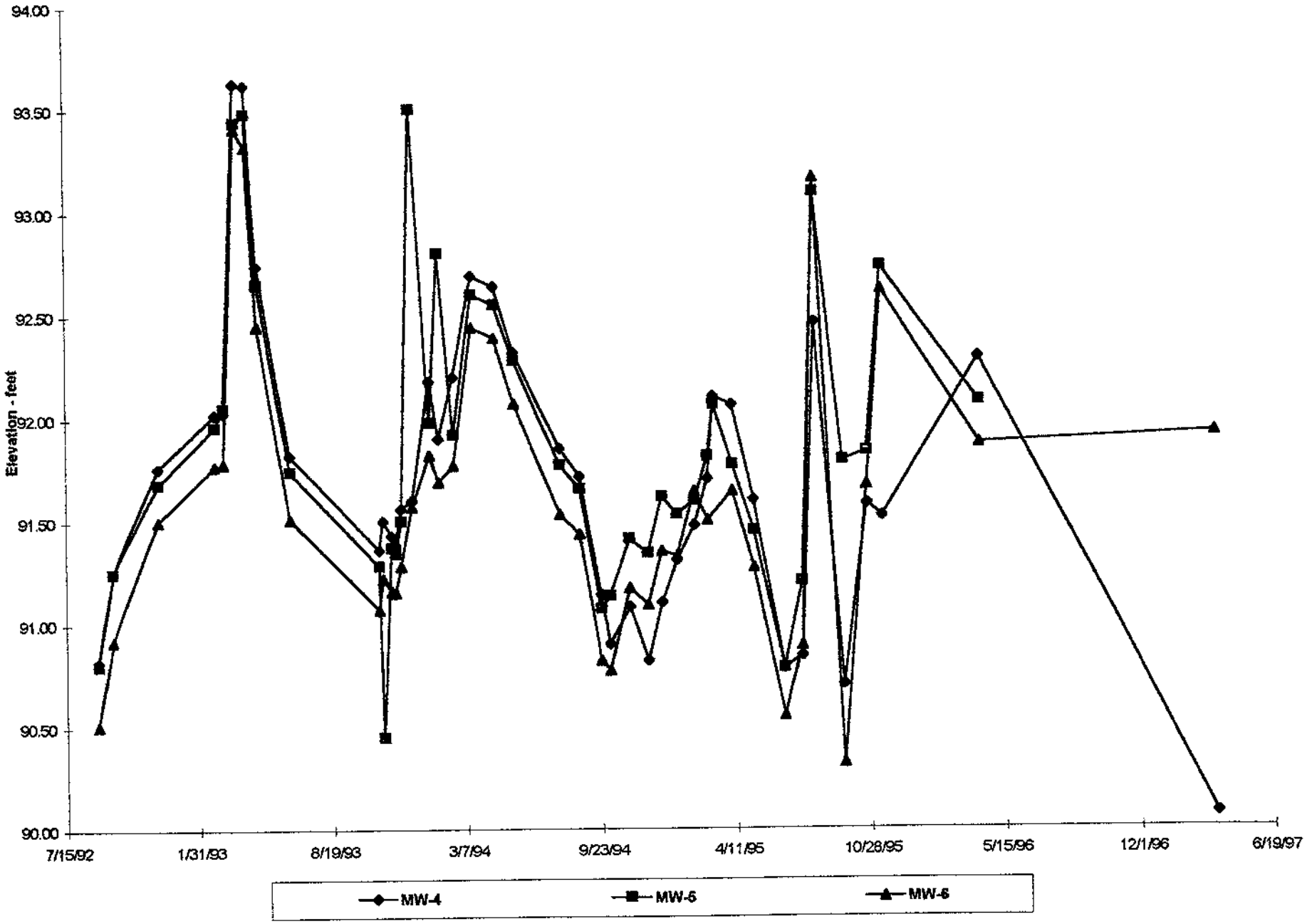

Chart 2

Northern Petroleum - St. Johnsbury
Ground Water Level Trends

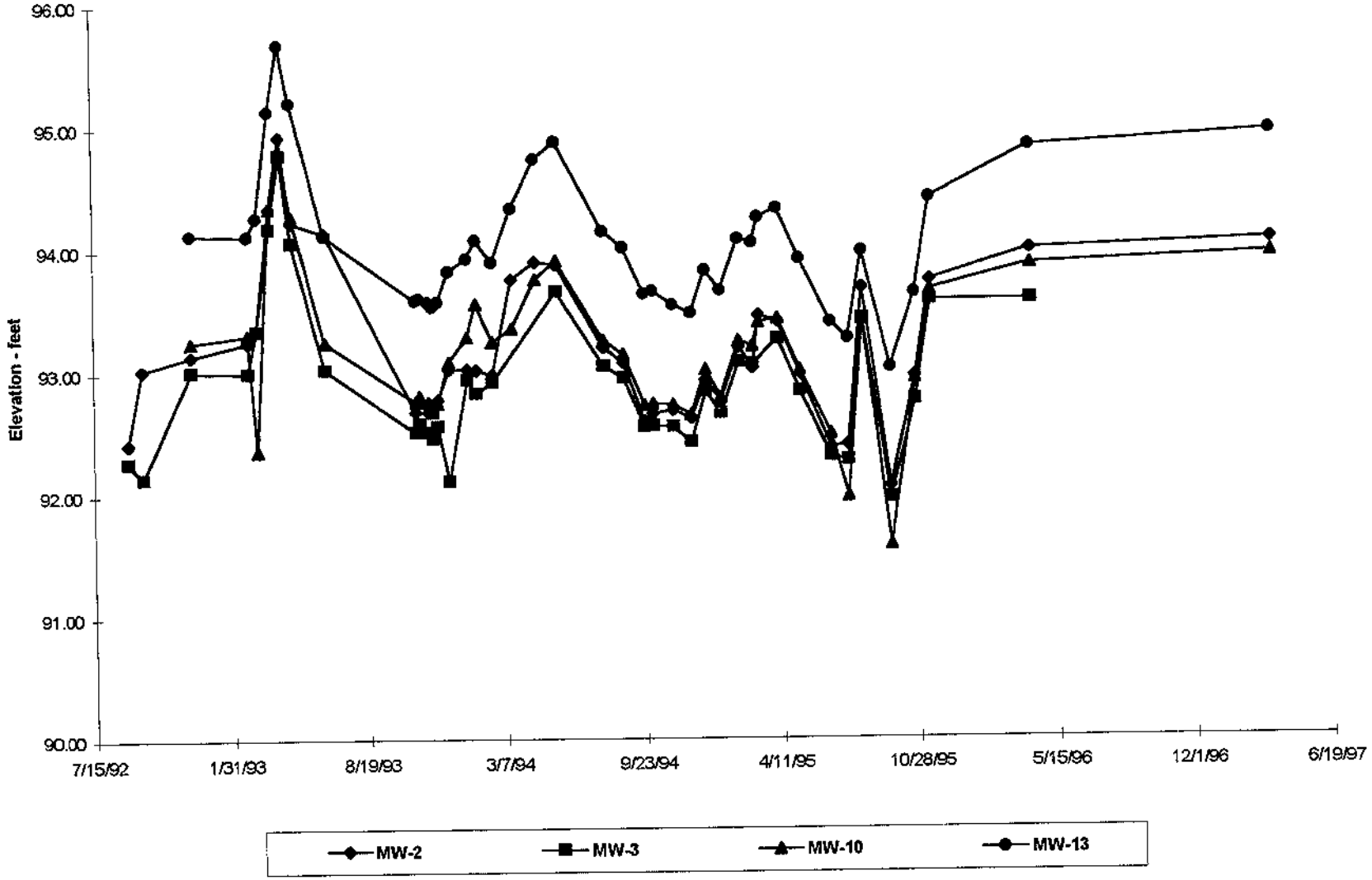

Chart 3

Northern Petroleum Co., St. Johnsbury, VT
MW-1 Ground Water and Liquid Levels

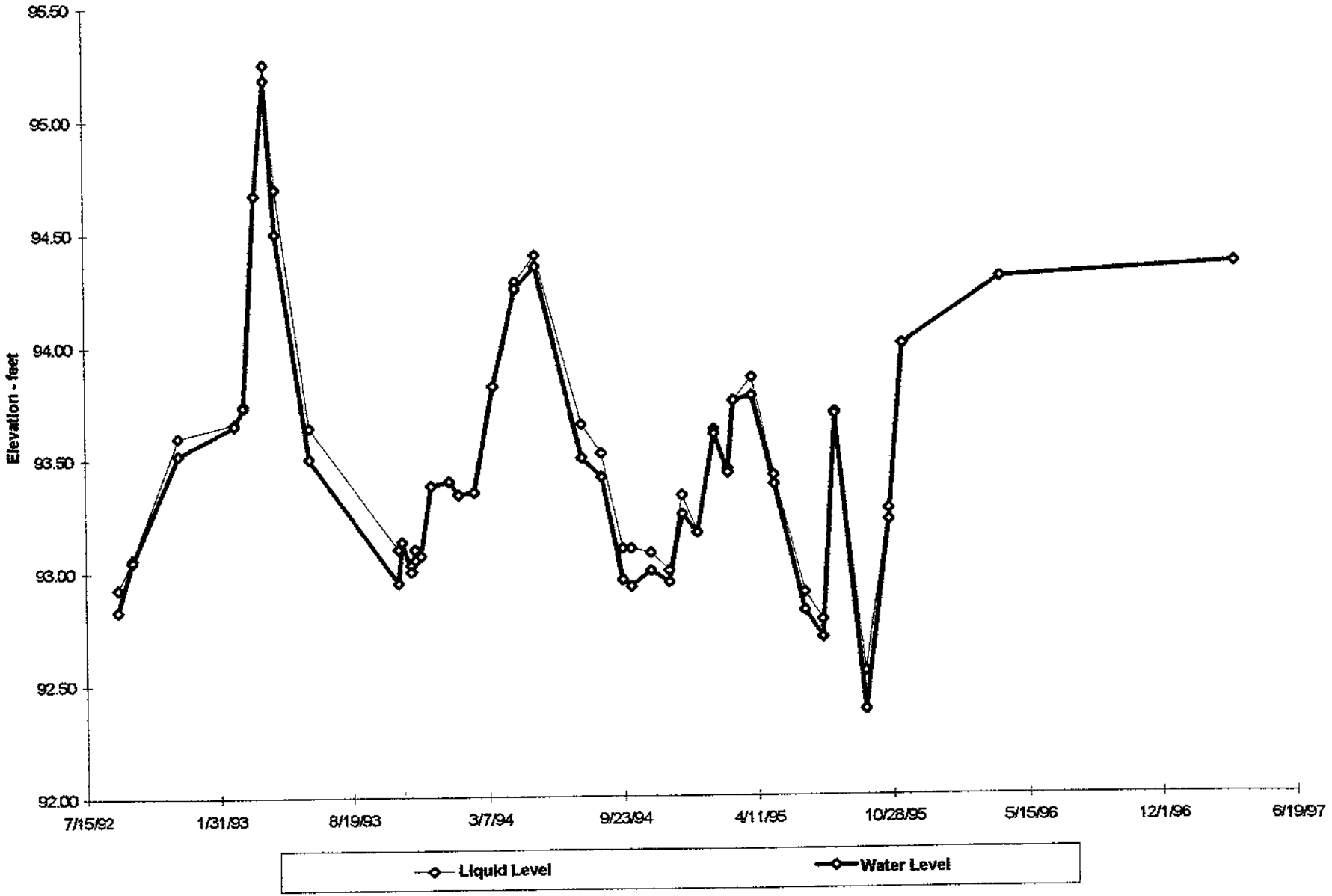

Chart 4

Northern Petroleum Co., St. Johnsbury, VT
MW-11 Ground Water and Liquid Levels

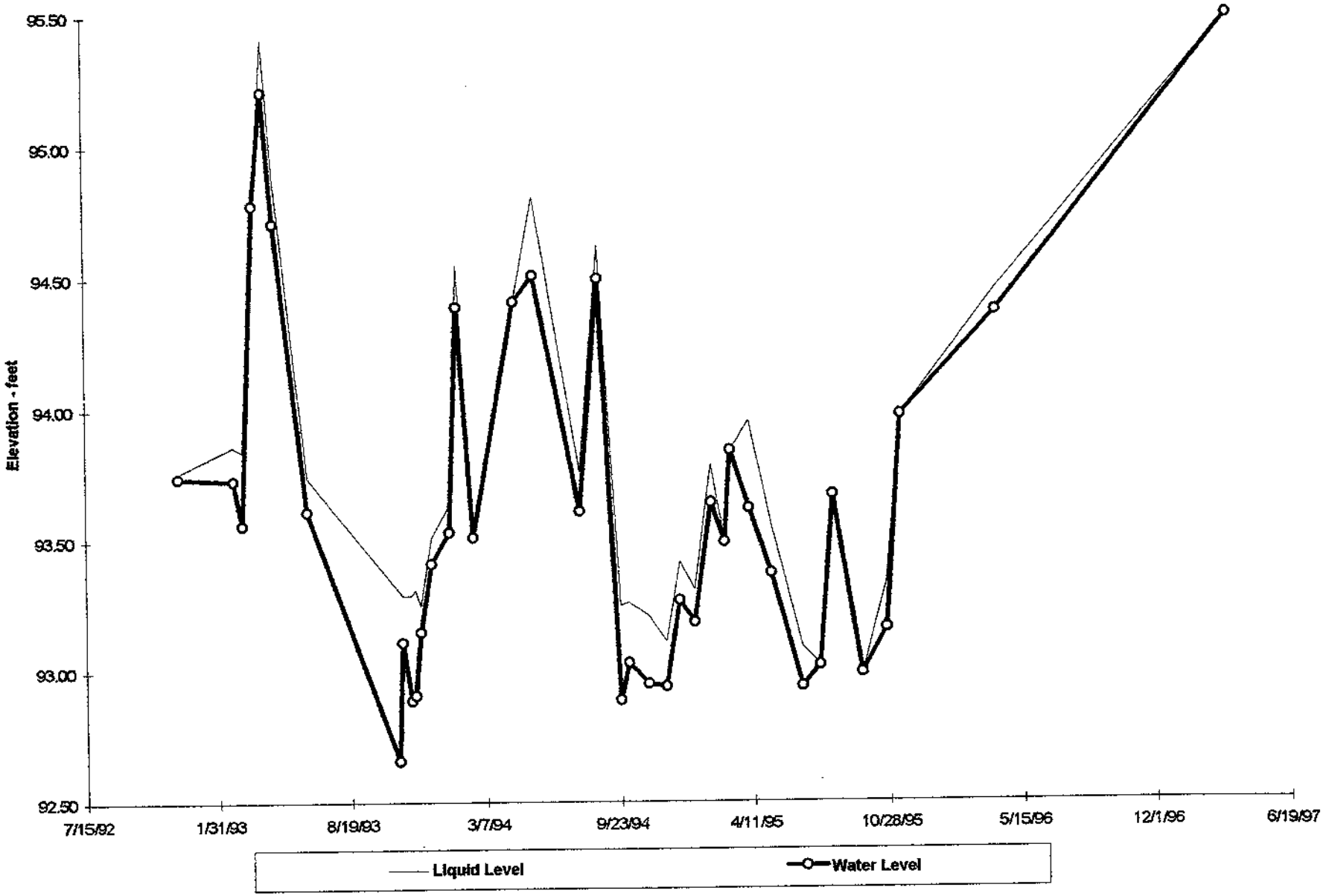

Chart 5

Northern Petroleum - St. Johnsbury
BTEX Contaminant Concentrations

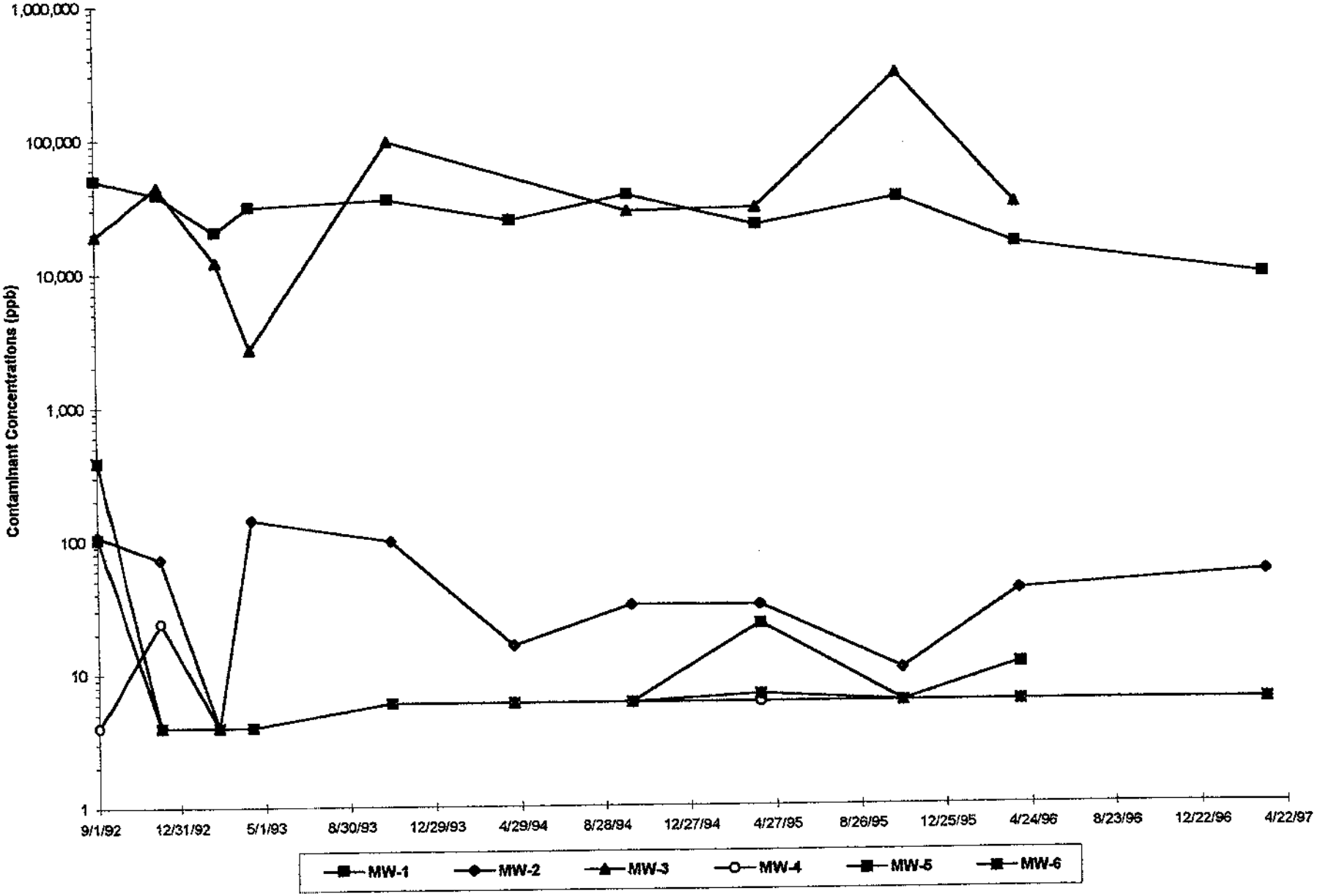

Chart 6

Northern Petroleum - St. Johnsbury
BTEX Contaminant Concentrations

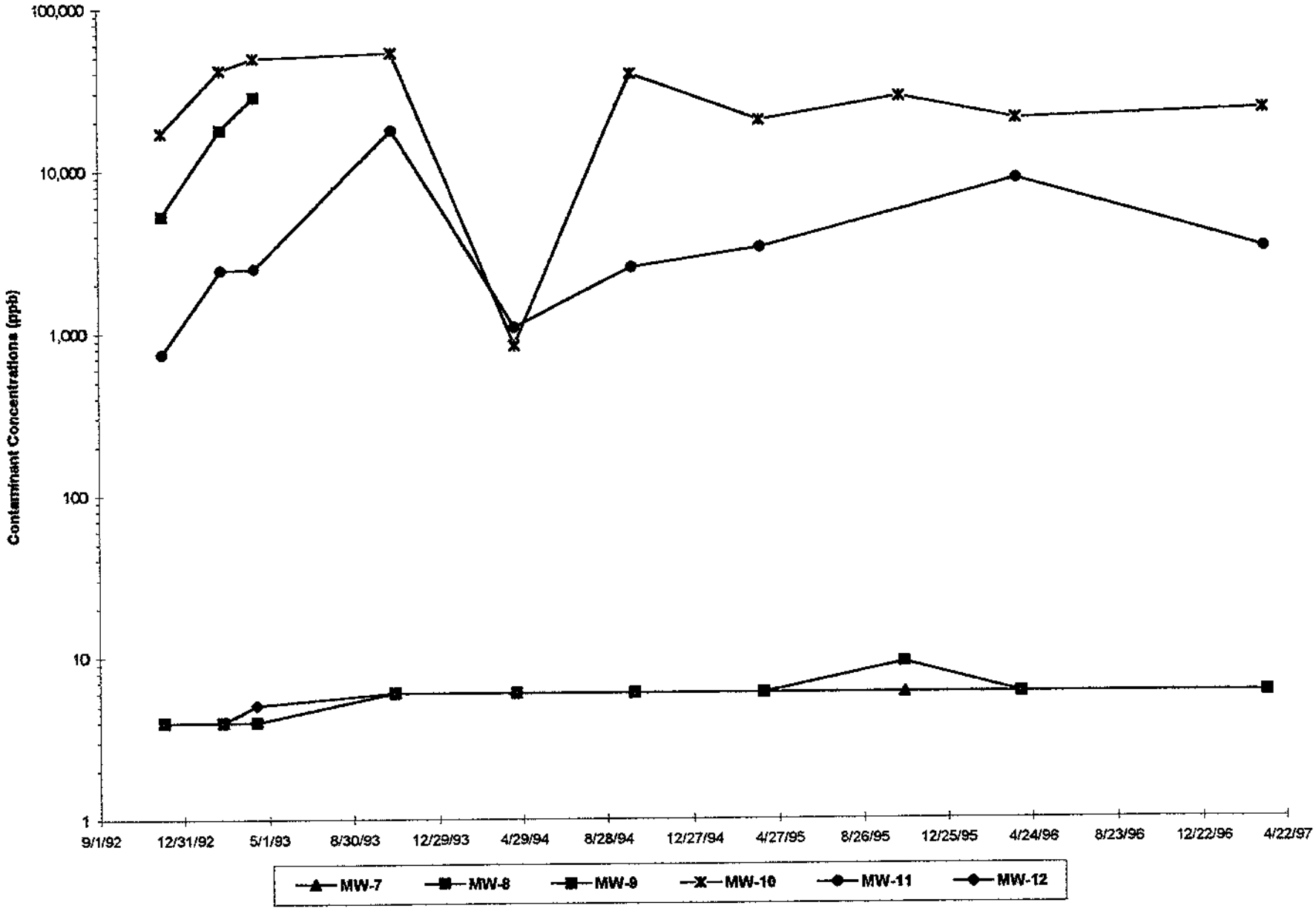

Chart 7

Northern Petroleum - St. Johnsbury
MTBE Contaminant Concentrations

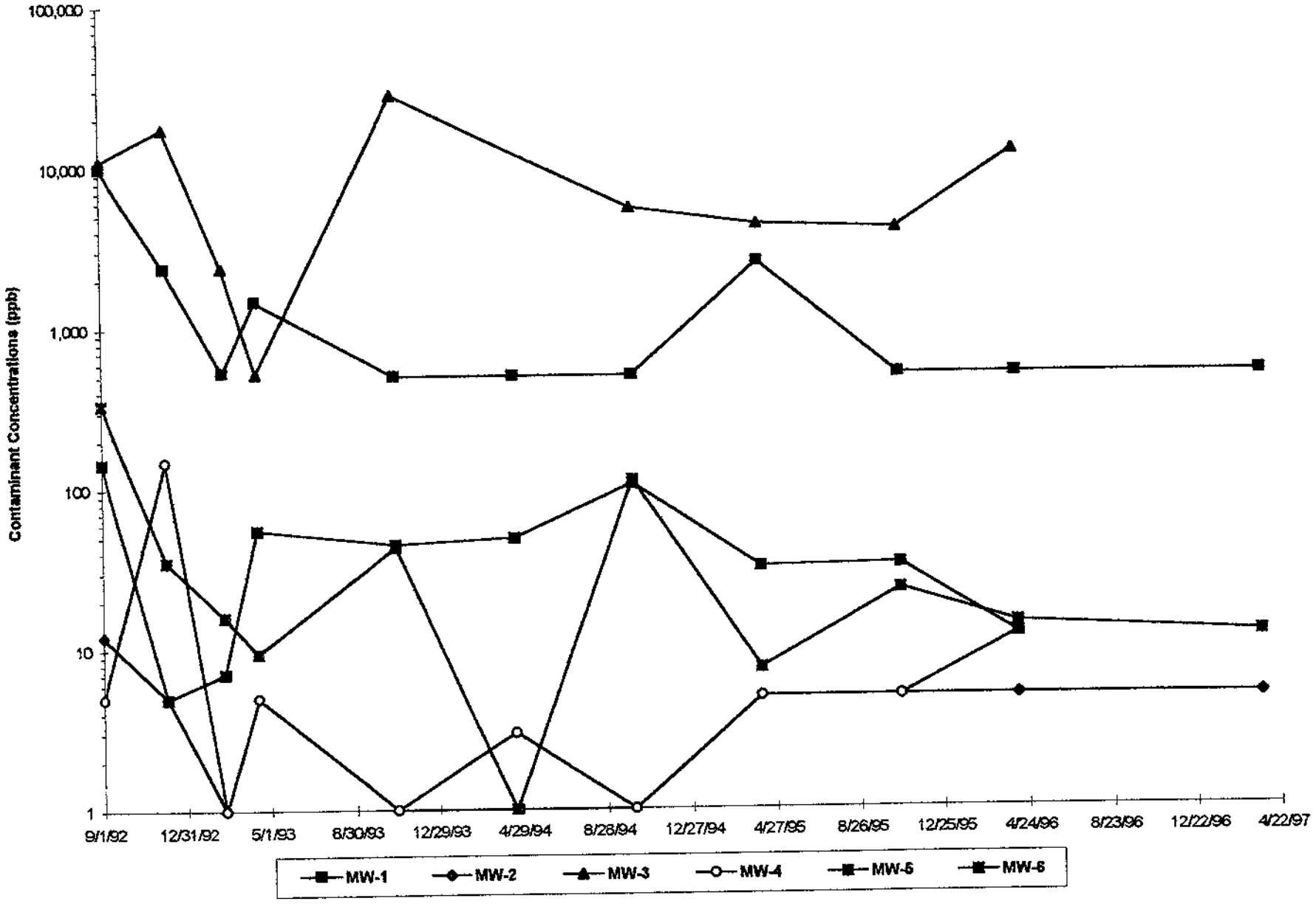

Chart 8

Northern Petroleum - St. Johnsbury
MTBE Contaminant Concentrations

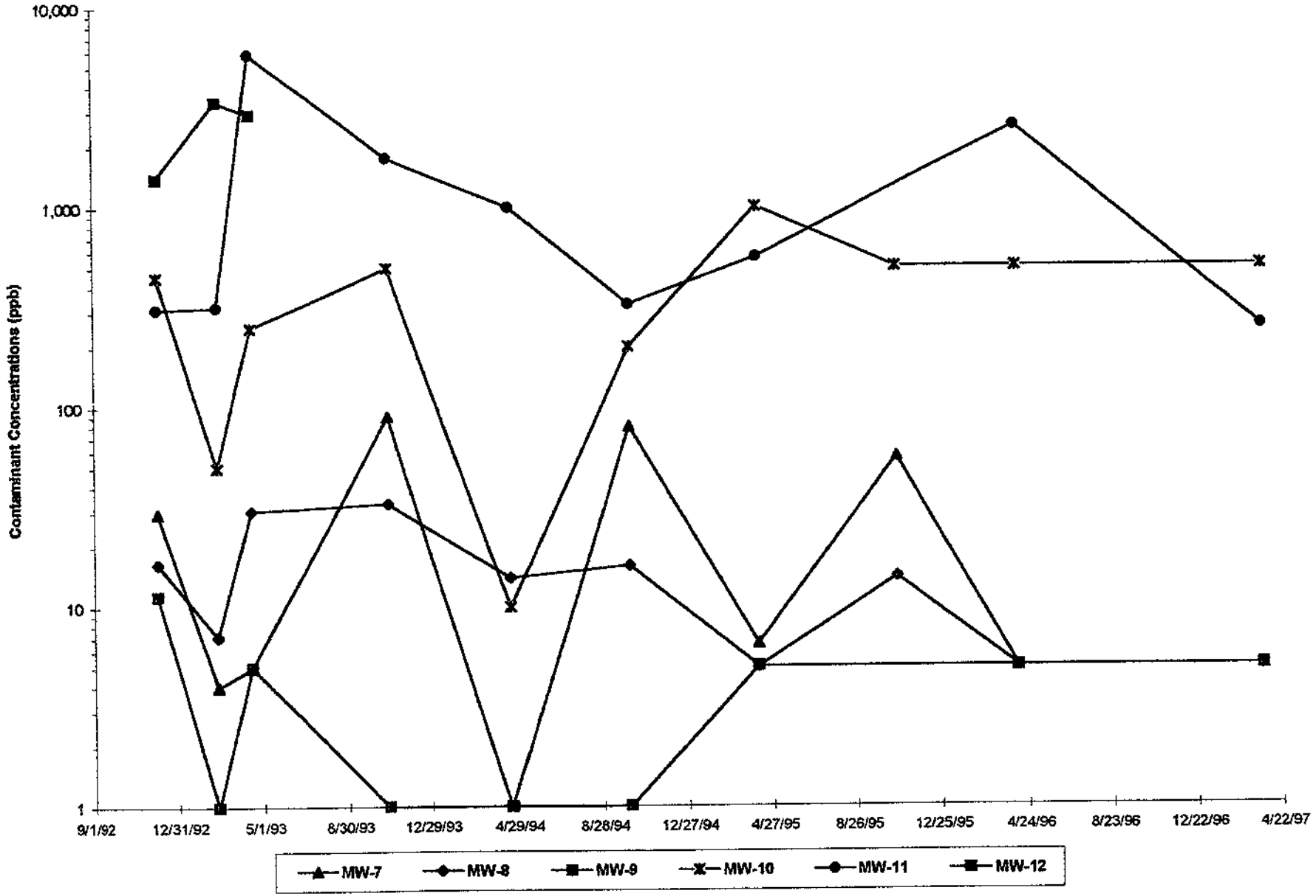

Chart 9

F:\CLIENTS\NPETROL\ST.JOHNS\CADD\SITEMAPS\stjohns.VCD 5/14/1997

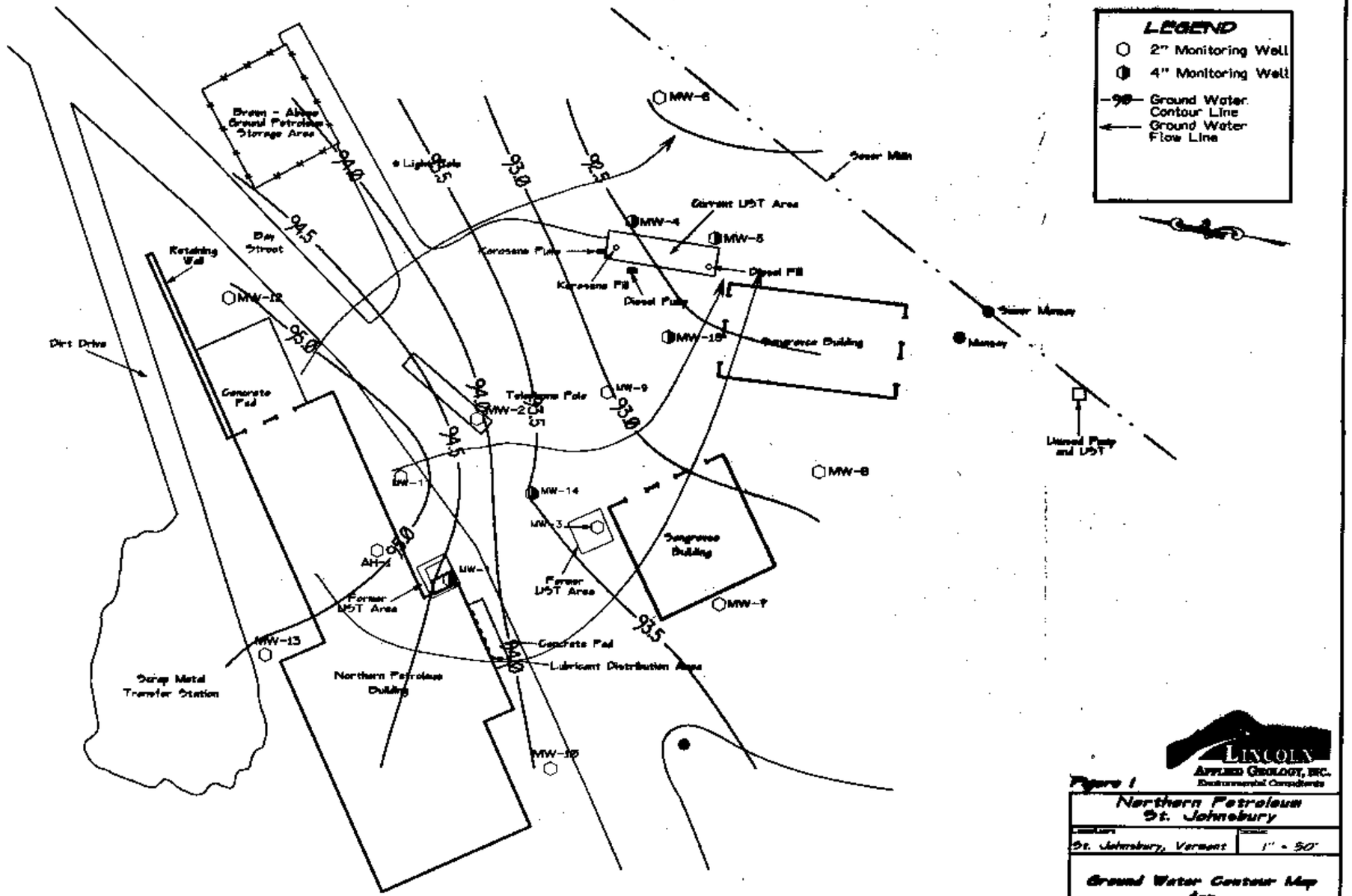

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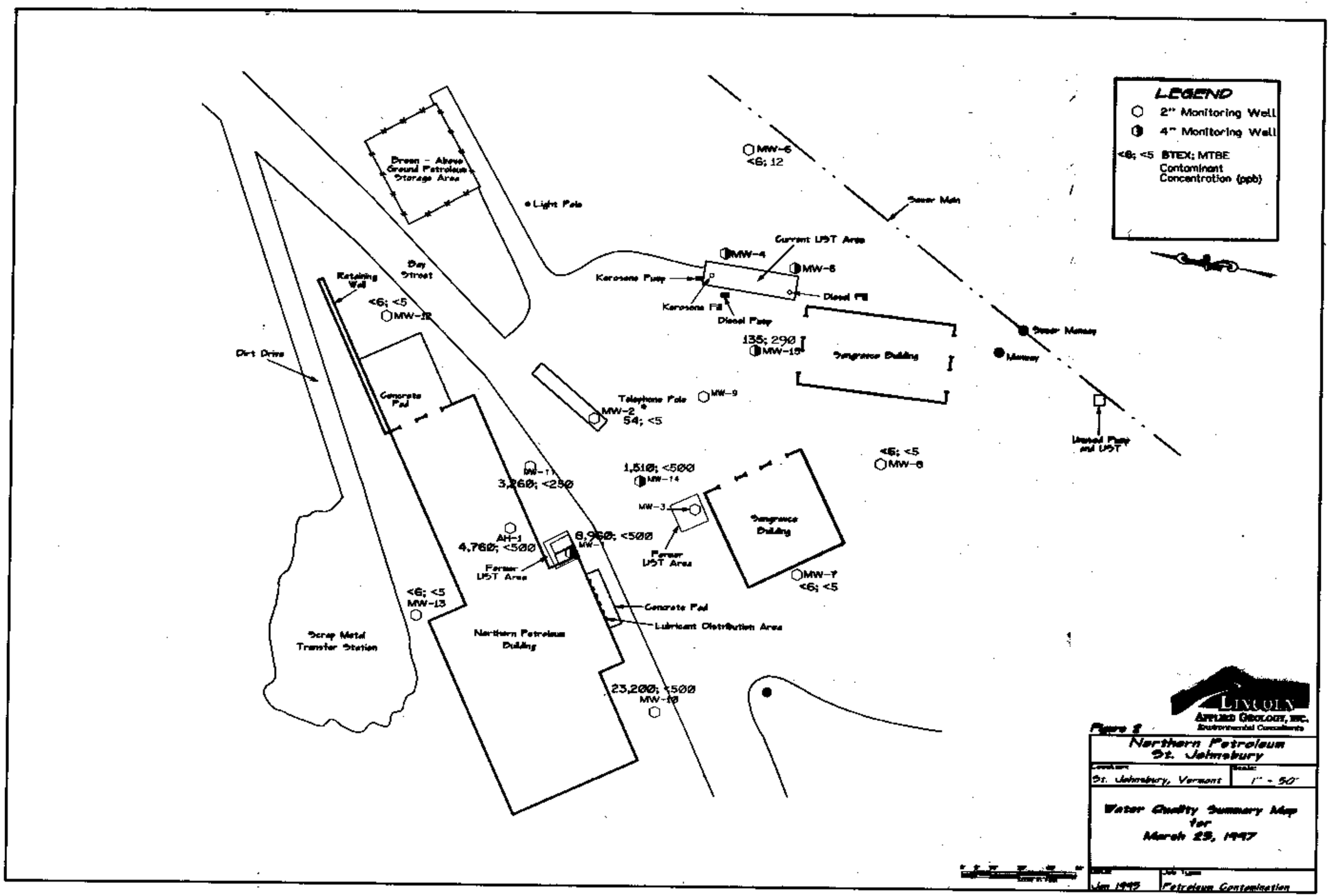
Figure 1

Northern Petroleum
St. Johnsbury

St. Johnsbury, Vermont | 1" = 50'

Ground Water Contour Map
for
March 25, 1997

Jan 1997 | Petroleum Contamination



LINCOLN APPLIED GEOLOGY, INC.
Environmental Consultants

Figure 2
Northern Petroleum
St. Johnsbury

St. Johnsbury, Vermont | 1" = 50'

Water Quality Summary Map
for
March 25, 1997

Jan 1997 | Petroleum Contamination

Appendix A

Recent Soakease Monitoring Logs

		4" MW1	2" MW11	4" Saw MW14	2" Saw MW3	2" office MW10
7 June	300PM	20"	15"	10"	15"	—
10 June	100PM	20"	15"	10"	15"	—
12 June	130PM	20"	15"	10"	15"	—
14 June	1200H	Changed	Changed	Changed	15"	—
17 June	100PM	10"	10"	15"	15"	—
19 June	200PM	10"	10"	15"	15"	—
21 June	130PM	15"	10"	15"	15"	—
24 June	200PM	Changed	10	15"	15"	—
26 June	130PM	15"	Changed	15"	15"	—
28 June	130PM	15"	15"	15"	15"	—
July 1	200PM	20"	20"	20"	15"	—
July 3	100PM	Changed	Changed	Changed	15"	—
July 5	1200H	10"	15"	10"	15"	5"
July 15	130PM	Changed	Changed	Changed	Changed	—

		4" MW1	2" MW11	4" Lawn MW14	2" lawn MW3	2" attic MW10
17 July	2.00 PM	10"	2"	10"	2"	5"
19 July	9.00 AM	20"	6"	10"	2"	— X
22 July	1.30 PM	20"	10"	10"	2"	—
24 July	2.30 PM	changed	changed	10"	2"	—
26 July	2.00 PM	15"	15"	15"	2"	—
29 July	2.30 PM	20"	15"	20"	2"	—
31 July	1.30 PM	20"	20"	20"	2"	—
2 aug	2.30 PM	changed	changed	20"	2"	—
5 aug	2.00 PM	20"	20"	changed	4"	—
7 aug	9.00 AM	20"	~~changed~~ 20"	20"	4"	5"
12 aug	2.00 PM	10"	10"	20"	4"	5"
14 aug	1.00 PM	10"	10"	20"	4"	—
16 aug	10.00 AM	changed	20"	changed	4"	—
19 aug	2.00 PM	20"	20"	20"	4"	—

		4" MW1	2" MW11	4" 4Aw MW14	2" MW3	2" MW10
2 Aug	200PM	20"	20"	20"	4"	—
23 Aug	200PM	20"	20"	20"	4"	—
26 Aug	100PM	changed	changed	changed	4"	—
28 Aug	200PM	10"	10"	10"	4"	—
30 Aug	130PM	20"	10"	20"	4"	—
Sept 3	200PM	20"	20"	20"	4"	—
Sept 5	200PM	20"	changed	20"	4"	—
Sept 9	100PM	20"	10"	changed	4"	—
Sept 11	200PM	changed	10"	20"	4"	—
Sept 16	1230PM	20"	10"	20"	4"	—
Sept 18	100PM	changed	10"	20"	4"	—
Sept 23	1130AM	20"	15"	changed	4"	—
Sept 26	2PM	changed	15"	15"	4"	—
Oct	2PM	20"	20"	15"	4"	—

		4" MW 1	2" MW 11	4" Saw MW 14	2" Saw MW 3	2" office MW 10
4 oct	1030 AM	20"	20"	changed	4"	—
9 oct	100 PM	changed	20"	10"	4"	—
14 oct	200 PM	20"	20"	10"	4"	—
17 oct	1130 AM	20"	20"	10"	4"	—
21 oct	130 PM	changed	changed	changed	changed	—
25 oct	100 PM	15"	5"	10"	1"	—
28 oct	200 PM	15"	5"	15"	3"	—
31 oct	3 PM	15"	5"	15"	3"	—
Nov 4	100 PM	20"	5"	20"	3"	—
Nov 6	230 PM	20"	5"	20"	3"	—
Nov 8	200 PM	changed	6"	20"	3"	—
Nov 12	100 PM	20"	6"	20"	3	—
Nov 15	100 PM	changed	6"	20"	3	—
Nov 18	200 PM	20"	10"	20"	3"	—

		4" MW1	2" MW11	4" low MW14	2" low MW3	2" elbow MW10
22 nov	1130	changed	changed	20"	3"	—
26 nov	8 AM	20"	~~20"~~ 10"	20"	3"	—
29 nov	11 AM	20"	15"	20"	3"	—
4 Dec	2 PM	changed	15"	changed	3"	—
9 Dec	1 PM	15"	15"	15"	broze	—
13 Dec	1 PM	15"	changed	15"	broze	—
16 Dec	2 00 PM	15"	10"	15"	broze	—
Dec 19	130 PM	15"	10"	20"	broze	—
23 Dec	2 00 PM	changed	changed	changed	broze	—
27 Dec	1 30 PM	15"	15"	15"	broze	—
Dec 30	1 PM	15"	20"	broze	broze	—
Jan 3	11 AM	changed	changed	broze	broze	—
6 Jan	1030 AM	changed	6"	broze	broze	—
9 Jan	1 PM	changed	6"	broze	broze	—

		4" MW1	2" MW11	4" MW14	2" MW3	2" MW10
13 Jan	130PM	20''	6''	Large	Large	—
16 Jan	10 AM	Changed	6''	Large	Large	—
22 Jan	12 00 N	Large	Large	Large		
28 Jan	2 00 PM		Large	Large		
5 Feb	2 00 PM		Large	Large		
13 Feb	130PM	Large		Large		
20 Feb	100PM	Large		Large		
26 Feb	2 00 PM	Large		Large		
4 March	12 N	Large		Large		
13 March	100 PM	Large		Large		
14 March	100PM		Large	Large		
25 March	2 PM	Large		Large		

Appendix B

March 25, 1997
Water Quality Laboratory Results

GREEN MOUNTAIN LABORATORIES, INC.

RR 3, BOX 5210

Montpelier, Vermont 05602

Phone (802) 223 - 1468 Fax (802) 223 - 8688

LABORATORY RESULTS

CLIENT NAME:	Lincoln Applied Geology	REFERENCE NO.:	2002
ADDRESS:	RD 1 Box 710	PROJECT NO.:	NA
	Bristol, VT 05443	DATE OF SAMPLE:	03/25/97
SAMPLE LOCATION:	Northern Petroleum	DATE OF RECEIPT:	03/25/97
SAMPLER:	J. Barnard & J. Holman	DATE OF ANALYSIS:	04/04-04/07/97
ATTENTION:	Rick Vandenberg	DATE OF REPORT:	04/11/97

Pertaining to the analyses of specimens submitted under the accompanying chain of custody form, please note the following:

- Water samples submitted for VOC analysis were preserved with HCl. The trip blank was prepared by the client from reagent water supplied by the laboratory.
- Specimens were processed and examined according to the procedures outlined in the specified method.
- Holding times were honored.
- Instruments were appropriately tuned and calibrations were checked with the frequencies required in the specified method.
- Blank contamination was not observed at levels interfering with the analytical results.
- Continuing Calibration standards were monitored at intervals indicated in the specified method. The resulting analytical precision and accuracy were determined to be within method QA/QC acceptance limits.
- The efficiency of analyte recovery for individual samples was monitored by the addition of surrogate analyte to all samples, standards, and blanks. Surrogate recoveries were found to be within laboratory QA/QC acceptance limits, unless noted otherwise.

Reviewed by:

Althea L. Lindell

Althea Lindell
Chemical Services

GREEN MOUNTAIN LABORATORIES, INC.

RR 3, BOX 5210
Montpelier, Vermont 05602

Phone (802) 223 - 1468 Fax (802) 223 - 8688

LABORATORY RESULTS

GC/MS METHOD - BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES) + MTBE

GML REF. # :	2002
STATION:	TRIP BLANK
ANALYSIS DATE:	04/04/97
DATE SAMPLED:	03/25/97
SAMPLE TYPE:	WATER

PARAMETER	PQL (µg/L)	Conc. (µg/L)
Benzene	1	ND
Toluene	1	ND
Ethylbenzene	1	ND
Xylenes	3	ND
MTBE	5	ND

Surrogate % Recovery: 98.1 %

ND = Not Detected
BPQL = Below Practical Quantitation Limits

GREEN MOUNTAIN LABORATORIES, INC.

RR 3, BOX 5210
Montpelier, Vermont 05602

Phone (802) 223 - 1468 Fax (802) 223 - 8688

LABORATORY RESULTS

GC/MS METHOD - BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES) + MTBE

GML REF. # :	2002
STATION:	MW-1
ANALYSIS DATE:	04/04/97
DATE SAMPLED:	03/25/97
SAMPLE TYPE:	WATER

PARAMETER	PQL (µg/L)	Conc. (µg/L)
Benzene	100	2400
Toluene	100	590
Ethylbenzene	100	370
Xylenes	300	5600
MTBE	500	ND

Surrogate % Recovery: 102 %

ND = Not Detected
BPQL = Below Practical Quantitation Limits

GREEN MOUNTAIN LABORATORIES, INC.

RR 3, BOX 5210

Montpelier, Vermont 05602

Phone (802) 223 - 1468 Fax (802) 223 - 8688

LABORATORY RESULTS

GC/MS METHOD - BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES) + MTBE

GML REF. # :	2002
STATION:	MW-2
ANALYSIS DATE:	04/04/97
DATE SAMPLED:	03/25/97
SAMPLE TYPE:	WATER

PARAMETER	PQL (µg/L)	Conc. (µg/L)
Benzene	1	20
Toluene	1	ND
Ethylbenzene	1	20
Xylenes	3	13
MTBE	5	ND

Surrogate % Recovery: 107 %

ND = Not Detected

BPQL = Below Practical Quantitation Limits

GREEN MOUNTAIN LABORATORIES, INC.

RR 3, BOX 5210

Montpelier, Vermont 05602

Phone (802) 223 - 1468 Fax (802) 223 - 8688

LABORATORY RESULTS

GC/MS METHOD - BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES) + MTBE

GML REF. # :	2002
STATION:	MW-6
ANALYSIS DATE:	04/04/97
DATE SAMPLED:	03/25/97
SAMPLE TYPE:	WATER

PARAMETER	PQL (µg/L)	Conc. (µg/L)
Benzene	1	ND
Toluene	1	ND
Ethylbenzene	1	ND
Xylenes	3	ND
MTBE	5	12

Surrogate % Recovery: 101 %

ND = Not Detected

BPQL = Below Practical Quantitation Limits

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LABORATORY RESULTS

GC/MS METHOD - BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES) + MTBE

GML REF. # :	2002
STATION:	MW-7
ANALYSIS DATE:	04/04/97
DATE SAMPLED:	03/25/97
SAMPLE TYPE:	WATER

PARAMETER	PQL (µg/L)	Conc. (µg/L)
Benzene	1	ND
Toluene	1	ND
Ethylbenzene	1	ND
Xylenes	3	ND
MTBE	5	ND

Surrogate % Recovery: 104 %

ND = Not Detected

BPQL = Below Practical Quantitation Limits

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LABORATORY RESULTS

GC/MS METHOD - BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES) + MTBE

GML REF. # :	2002
STATION:	MW-8
ANALYSIS DATE:	04/05/97
DATE SAMPLED:	03/25/97
SAMPLE TYPE:	WATER

PARAMETER	PQL (µg/L)	Conc. (µg/L)
Benzene	1	ND
Toluene	1	ND
Ethylbenzene	1	ND
Xylenes	3	ND
MTBE	5	BPQL

Surrogate % Recovery: 101 %

APR 2 0 '97

ND = Not Detected

BPQL = Below Practical Quantitation Limits

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LABORATORY RESULTS

GC/MS METHOD - BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES) + MTBE

GML REF. # :	2002
STATION:	MW-10
ANALYSIS DATE:	04/05/97
DATE SAMPLED:	03/25/97
SAMPLE TYPE:	WATER

PARAMETER	PQL (µg/L)	Conc. (µg/L)
Benzene	100	5100
Toluene	100	11000
Ethylbenzene	100	1100
Xylenes	300	6000
MTBE	500	ND

Surrogate % Recovery: 106 %

ND = Not Detected
BPQL = Below Practical Quantitation Limits

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LABORATORY RESULTS

GC/MS METHOD - BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES) + MTBE

GML REF. # :	2002
STATION:	MW-11
ANALYSIS DATE:	04/07/97
DATE SAMPLED:	03/25/97
SAMPLE TYPE:	WATER

PARAMETER	PQL (µg/L)	Conc. (µg/L)
Benzene	50	530
Toluene	50	120
Ethylbenzene	50	210
Xylenes	150	2400
MTBE	250	ND

Surrogate % Recovery: 106 %

APR 2 3 1997

ND = Not Detected

BPQL = Below Practical Quantitation Limits

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LABORATORY RESULTS

GC/MS METHOD - BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES) + MTBE

GML REF. # :	2002
STATION:	MW-12
ANALYSIS DATE:	04/05/97
DATE SAMPLED:	03/25/97
SAMPLE TYPE:	WATER

PARAMETER	PQL (µg/L)	Conc. (µg/L)
Benzene	1	ND
Toluene	1	ND
Ethylbenzene	1	ND
Xylenes	3	ND
MTBE	5	ND

Surrogate % Recovery: 99.9 %

ND = Not Detected
BPQL = Below Practical Quantitation Limits

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LABORATORY RESULTS

GC/MS METHOD - BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES) + MTBE

GML REF. # :	2002
STATION:	MW-13
ANALYSIS DATE:	04/07/97
DATE SAMPLED:	03/25/97
SAMPLE TYPE:	WATER

PARAMETER	PQL (µg/L)	Conc. (µg/L)
Benzene	1	ND
Toluene	1	ND
Ethylbenzene	1	ND
Xylenes	3	ND
MTBE	5	ND

Surrogate % Recovery: 102 %

ND = Not Detected

BPQL = Below Practical Quantitation Limits

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LABORATORY RESULTS

GC/MS METHOD - BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES) + MTBE

GML REF. # :	2002
STATION:	MW-14
ANALYSIS DATE:	04/07/97
DATE SAMPLED:	03/25/97
SAMPLE TYPE:	WATER

PARAMETER	PQL (µg/L)	Conc. (µg/L)
Benzene	100	170
Toluene	100	240
Ethylbenzene	100	ND
Xylenes	300	1000
MTBE	500	ND

Surrogate % Recovery: 101 %

ND = Not Detected

BPQL = Below Practical Quantitation Limits

APR [illegible] 1997

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Page 1 of 1

GML #

2000

GML SAMPLE #

Client Name Lincoln Applied Geology, (LAG)
Address Box 710 Bristol, VT 05443
Phone / Fax (802) 453-4354
Project Name Northern Petroleum St. Johnsbury
Project Number
Project Manager Rick Vandenberg
Sampler Jason Barnard Jim Heiman

Analysis Requested: BTEX, MTBE

#	Sample Location	Date	Time	# of Cont.	Pres.	Sample Type	BTEX, MTBE	Remarks
1	Trip Blanks	3/25/97	8:00	2	HCl	H2O	X	
2	Mw-1	3/25/97	11:40	2	HCl		X	
3	Mw-2		2:55		HCl		X	
	~~Mw-3~~		~~2:50~~		HCl		X	
4	Mw-6		3:02				X	
5	Mw-7		2:12				X	
6	Mw-5		2:30				X	
7	Mw-10		14:57				X	
8	Mw-11		14:50				X	
9	Mw-12		14:20				X	
10	Mw-13		14:25				X	
11	Mw-14		3:20				X	
12	Mw-15		15:05				X	
13	AH-1		3:10					

Chain of Custody

Relinquished By:	Date / Time: 3/25/97 430	Received By:	Date / Time: 3/25/97 1630
Relinquished By:	Date / Time:	Received By:	Date / Time:
Relinquished By:	Date / Time:	Received By:	Date / Time:
Relinquished By:	Date / Time:	Received By:	Date / Time:

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LABORATORY RESULTS

GC/MS METHOD - BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES) + MTBE

GML REF. # :	2002
STATION:	MW-15
ANALYSIS DATE:	04/07/97
DATE SAMPLED:	03/25/97
SAMPLE TYPE:	WATER

PARAMETER	PQL (µg/L)	Conc. (µg/L)
Benzene	5	110
Toluene	5	ND
Ethylbenzene	5	ND
Xylenes	15	ND
MTBE	25	290

Surrogate % Recovery: 100 %

ND = Not Detected
BPQL = Below Practical Quantitation Limits

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LABORATORY RESULTS

GC/MS METHOD - BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES) + MTBE

GML REF. # : 2002
STATION: AH-1
ANALYSIS DATE: 04/07/97
DATE SAMPLED: 03/25/97
SAMPLE TYPE: WATER

PARAMETER	PQL (µg/L)	Conc. (µg/L)
Benzene	100	990
Toluene	100	300
Ethylbenzene	100	370
Xylenes	300	3100
MTBE	500	ND

Surrogate % Recovery: 100 %

ND = Not Detected
BPQL = Below Practical Quantitation Limits